

REMARKS

Claim Rejections under 35 USC §112, First Paragraph

Claims 3 and 4 stand rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement.

Specifically, the Examiner is asserting that it is unclear what the “APC body” is referring to in claim 3. Claim 3 has been amended to recite “automatic pallet changer” instead of APC as recited on page 6, lines 20-21 of the specification.

Further, in claim 3 the Examiner asserts it is unclear “when the swivel servomotor is turned on and off, said pallet change arm is swiveled ...”. This feature finds support on page 12, lines 10-12 of the specification. The pallet arm is swiveled when the servomotor is turned on and off. Claim 3 has been amended to recite “said pallet change arm is swiveled and positioned at a predetermined position when the swivel servomotor is turned on and off”.

In claim 4 the Examiner asserts that it is unclear what is meant by “said pallet change arm is positioned in a standby position for being ready without a pallet changing operation, in a first pallet grip position, in a second pallet grip position”. This feature finds support in page 12, lines 15-19 of the specification. This feature is further detailed on page 12, lines 20-27 which states,

“In some cases, the arm 40 is positioned at the first pallet grip position S1. In those cases, one pallet grip portion 41 is positioned at the table 6 and the other pallet grip portion 41 is positioned at the pallet setup base 11.

In some cases, the arm 40 is positioned at the second pallet grip 25 position S2. In those cases, one pallet grip portion 41 is positioned at the pallet setup base 11 and the other pallet grip portion 41 is positioned at the table 6.”

Claim 4 is amended to further clarify the claim language.

Therefore, withdrawal of the rejection of claims 3 and 4 under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement is respectfully requested.

Claim Rejections under 35 USC §112, Second Paragraph

Claims 1-9 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Specifically, the Examiner is objecting to claim 1, line 9 and claim 6, line 8 which states “positioned while directing upwardly”. This feature finds support on page 7, lines 13-16 of the specification. Taking the Examiner’s comments into consideration claims 1 and 6 have been amended to recite “said table is swingable and positioned while being directed in an upward direction and also making at least an index motion”.

Further, the Examiner is objecting to claim 2, line 3 and 6 which states “a supporting shaft for supporting said pallet change arm is disposed in the vicinity of the machining area and outside the machining area”. This feature finds support on page 10, lines 19-21 and lines 22-25 of the specification. Taking the Examiners’ comments into consideration, claim 2 has been amended.

Still further the Examiner is objecting to claim 9, lines 2-3 which states “said machine tool performs a cutting by a rotating tool and performs a turning by a turning tool to the workpiece”. This

feature finds support on page 6, line 27 through page 7, line 1. Taking the Examiners' comments into consideration, claim 2 has been amended.

Therefore, withdrawal of the rejection of Claims 1-9 under 35 U.S.C. 112, second paragraph, is respectfully requested.

Claim Rejections under 35 USC §103

Claims 1-9 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,678,291 to Braun in view of U.S. Patent No. 5,992,608 to Ahn; and in the alternative Ahn in view of Braun.

The present invention is a machine tool (MC 1) provided with a automatic pallet changer (APC 10). This machine tool (MC 1) may machine a workpiece (2) in a five-axis control. The machine tool (MC 1) includes a spindle head (5) which is movable in three transverse axes directions relative to a workpiece (2). The workpiece (2) is supported by a pallet (7) mounted on a table (6). The table (6) is below the spindle head (5). The table (6) is driven by a table drive unit (30) so that the table (6) is swingable while being directed in an upward direction. The table drive unit (30) is also capable of making an index motion. The automatic pallet changer (APC 10) includes a pallet setup base (11) and a pallet change arm (40). The pallet setup base (11) is located outside the machining area of the machine tool (MC 1). A pallet is placed on the pallet setup base (11). The pallet change arm (40) has at least one pallet grip portion (41) and preferably two pallet grip portions (41) which are used to grip and release the pallet as indicated on page 7, lines 24-28 of the

specification. The pallet change arm (40) swivels substantially in a horizontal plane and moves up and down. The pallet change arm (40) moves the pallet from the table (6) and the pallet setup base (11).

Braun describes a machine tool in which in the prior art section of Braun is described a five axis machine tool. As discussed in column 6, line 21 of Braun the first work holding means has an index fixture. The Braun device also has a machining head (37) which is designed to move tools (38) in all three directions of travel as described in column 6, lines 1-5 of the Braun specification. As admitted by the Examiner Braun fails to describe an automatic pallet changer (APC 10).

Ahn describes an automatic pallet changer which is used to change an inner pallet which is inside a cutting compartment with an outer pallet located outside the cutting compartment. The pallet changer uses two pairs of split grippers (34 and 38).

Claims 1 and 6 have been amended to distinguish the claims over the prior art by stating that the table (6) as driven by the table drive unit (30) is also capable of making rotational motion as well as an index motion. This feature finds support on page 8, lines 23-26 of the specification. The prior art of record fails to disclose this feature. Therefore, claims 1 and 6 patentably distinguish over the prior art relied upon, by reciting, as exemplified by claim 1,

“A pallet changer, for changing pallets, provided on a machine tool being a five-axis controlling machine tool, said machine tool comprising: a spindle head being movable in three mutually transverse axes directions relative to a workpiece supported by a pallet mounted on a table; and said table disposed below a level of said spindle head, said table is driven by a table drive unit so that said table is swingable and positioned while being directed in an upward direction and also making at least an index motion, wherein said table as driven by said table drive unit is also capable of making rotational motion as well as the index motion, said pallet

changer comprising: a pallet setup base, provided outside a machining area of said machine tool, for placing the pallet on said pallet setup base; and a pallet change arm, which is provided with at least one pallet grip portion for gripping and releasing the pallet, for making a swivel motion substantially in a horizontal plane and for moving up and down, wherein said pallet change arm makes the swivel motion and moves up and down so that the pallet is transferred between said table and said pallet setup base and is received and discharged to said table and said pallet setup base, respectively.” (Emphasis Added)

Therefore, withdrawal of the rejection of claims 1-9 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,678,291 to Braun in view of U.S. Patent No. 5,992,608 to Ahn; and in the alternative Ahn in view of Braun is respectfully requested.

New Claims

New claims 10 and 11 have been added to this application. New claims 10 and 11 correspond to the original claims 1 and 6, respectively. The new claims includes the feature of “wherein said pallet change arm which is moved up and down ascends up to a predetermined lifted position, while said pallet change arm makes the swivel motion and is under a standby condition, so that said pallet change arm does not interfere with other structural components of said machine tool”, respectively. This feature finds support on page 11, lines 7-10 of the specification. The prior art of record fails to disclose this feature. Therefore, allowance of new claims 10 and 11 is respectfully requested.

Conclusion

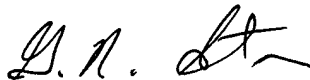
In view of the aforementioned amendments and accompanying remarks, the claims, as amended, are believed to be patentable and in condition for allowance, which action, at an early date, is requested.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact the applicants undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, the applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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